Cognitive Differences in Chart Reading: A Comparison of Nurses and Physicians

Todd R. Johnson, PhD[1], Vimla L. Patel, PhD, DSc[2], James P. Turley, PhD, RN[1]
[1]University of Texas Health Science Center, School of Health Information Sciences
[2]Columbia University, Departments of Medical Informatics and Psychiatry

Abstract

This pilot study compares the mental models of a patient constructed by nurses and physicians while reading an electronic medical record. Preliminary results suggest that the participants' summaries were both quantitatively and qualitatively different. The physician made more inferences and focused on deeper relationships in the record, whereas the nurse focused on the descriptive surface structure of the record.

Background. Patient care is a collaborative effort of a team of clinicians with widely differing, but complementary, skills, training, goals, responsibilities, and knowledge. One critical component affecting the quality of patient care is the mental model of the patient that each clinician derives from the patient record. Although it is widely believed that different types of clinicians (such as doctors and nurses) construct somewhat different mental models of the patient, the extent and nature of these differences has not been studied. Some differences are clearly necessary, due to the different goals of clinicians; but other differences could negatively affect patient care. The pilot study reported here examines differences between the mental models constructed by nurses and physicians reading the same patient record.

Methods. Three mock electronic medical records (EMR) were presented to a physician and a nurse. Participants were asked to generate patient summaries based on the contents of each record. Think-aloud verbal protocols, eye-movement data, and page selections were collected while participants worked through each record. After finishing with a record, it was removed and then the participant dictated a summary. The current analysis involves the comparison of one such set of patient summaries. To capture the complexity of the summaries that were generated by the participants, a propositional analysis [1-2] was used to create a text-based model of the summaries in which idea units are identified and their inter-relationships compared. A propositional analysis of the original EMR was also done in order to identify which ideas expressed by the participants constitute direct recall of the text, and which constitute inferences. Since inferences represent an idea that is generated from the information given in the text, they are considered to be a more abstract description.

Results. Text segments in the summaries were identified as being either direct recall of the original text, inferences generated from the original text, or uncoded information that is not present in the original text. The majority (50%) of the text segments in the physician's summary were inferences, 30% were recall and 20% were uncoded. In comparison, the majority (79%) of the text segments in the nurse's summary were direct recall, where the remaining 21% were inferences. Therefore, the preliminary results of the analysis suggest that the participants' summaries were both quantitatively and qualitatively different, where the physician mainly drew inferential information from the EMR and the nurse mainly recalled descriptive information from the EMR. The physician focused on deeper relationships found in the original text while the nurse focused on the descriptive surface structure of the text.

Conclusion. The preliminary results of this pilot study suggest fundamental differences in nurses' and physicians' mental models of a patient. A better understanding of these differences has implications for the design of EMRs, and possibly for clinician training. Differences in mental models could also affect the quality of patient care. To better understand these differences we are currently collecting and analyzing data from 8 additional participants.

References

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